THE MOTOR AGE

VOL. I. CHICAGO, SEPTEMBER 26, 1899. NO. 3.

ENTERED AT THE CHICAGO POST OFFICE AS SECOND-CLASS MATTER.

THE MOTOR AGE is published every Tuesday by THE CYCLE AGE COMPANY, at 324 Dearborn St., Chicago.
Subscription price in the United States, Canada, and Mexico, $2.00 per year; foreign countries (in postal union), $4.00 per year, payable invariably in advance.
Advertising rates on application. Copy for changes in advertisements must be in hand the Thursday previous to publication to insure insertion.

LEADING CONTENTS

CHANCE FOR FREE PUBLICITY

IN ORDER TO ADVANCE THE TIME WHEN THE GENERAL PUBLIC SHALL FEEL JUSTIFIED IN PLACING ORDERS FOR MOTOR VEHICLES THE MOTOR AGE OFFERS ITS SPACE FOR DESCRIPTION OF TESTS WITNESSED BY ITS REPRESENTATIVES.

Two anxious inquirers wish to know if The Motor Age intends to discourage the public from purchasing motor vehicles at present. They have observed that The Motor Age does not join in the hue and cry according to which one should believe that every motor vehicle turned out by the Thomas, Richard & Henry Mfg. Company is destined to revolutionize the transportation problem.

Well, the inquirers may remain calm. True, the voice of The Motor Age is not pitched to a shriek. It does not go into hysterics over any production, whose maker—best acquainted as he is with its possible shortcomings—evinces no desire to make its capabilities reliably known by public test, contest or long distance race. There is hardly sufficient reason for showing more enthusiasm in a journal that aims to be useful to the public as well as to the industry, than manufacturers show in their acts. Their acts and omissions speak a much plainer language than mere words of mouth or pen, and one in which their best judgment of the merits of their goods finds sincere expression.

The best of the manufacturers are not anxious to sell goods until they have them right. Not upon their own representations. If some journal is willing to do the guaranteeing, out of its own irresponsibility, manufacturers will accept the purchase price, of course; manufacturers are only human.

But The Motor Age is not anxious to be the agency through which the public may be induced to contribute unwittingly to the experimental department of the motor vehicle industry. If the public desire to contribute with eyes open, well and good. That is patriotic and commendable. But The Motor Age is not agitating in favor of such rare liberality.

However, the time will come—it is coming fast—when here and there motor vehicles will be manufactured which will give excellent service for one or another class of work. Races and contests will be organized at which the merits of vehicles will be demonstrated by loud facts.

The shrill blast of triumph can wait for such and other complete and reliable demonstrations, which are yet to come.

Sounded every week upon the sanguine assurances of Thomas, Richard & Henry, aforesaid, as now done in the boom publications of the industry, there would be no louder note left for the true events, nor would the manufacturers who first reach the point of producing vehicles of known and uniform suitability for practical service have the means at their disposal for having the merits of their articles plainly distinguished from mere commercial claims.

The financial stakes for makers of motor vehicles as well as purchasers are too great to permit much latitude for word jugglery. The mere professional scribe whose services are of value for soap advertisements, is a nuisance and a hindrance in an industry which deals vitally with the personal safety and economy of all concerned, and in which sentiment and bluster are reduced to a despised and indeed contemptible position.

Belief versus Demonstration.

The Motor Age, far from insisting, or intending to convey the idea, that no American motor vehicle has yet been produced which may be used with profit and convenience to the purchaser, is quite ready to believe and proclaim that the contrary is true whenever a maker or a user shall demonstrate that such is the fact.

As a matter of belief it may be asserted that most of the electric vehicles and several steam and gasolene motor vehicles are sufficiently perfected to be preferable to horse-traction under certain conditions. When it has been ascertained just wherein these conditions consist, belief may be changed to demonstration and become valuable for those prospective purchasers who cannot leave their homes in order to visit manufacturers and make personal investigations.

But the demonstration requires something more than a fifteen minute trial spin over a loft or smooth city streets. It requires more open publicity than the report of "factory tests," and it requires perfect assurance that the facts omitted from mention do not overbalance in importance those that are noted. Furthermore the questions of durability and economy require—when the time test is dispensed with—either complete revelation of construction principles or, better, the high strains of long distance racing together with publicity in regard to repairs.

These factors have been lacking in the American industry so far.

Until these factors shall have made their appearance The Motor Age must talk in a low-pitched voice, awaiting further developments, but meanwhile it offers to all makers and builders and users of motor vehicles to send competent representatives—upon reasonable notice and payment of cost—to witness or make practical tests with any complete vehicle or motor and describe the same minutely and at any required length in the pages of The Motor Age, free of any charge for the space occupied.

THE GERMAN ELECTRIC OMNIBUS

SMOOTH PAVEMENT ENABLES BERLIN SOCIETY TO PLACE SUCCESSFUL ELECTRIC OMNIBUS IN SERVICE.—BATTERIES RUN TWO HOURS ON ONE CHARGE.—TIME FOR RECHARGING REDUCED BY NEW SYSTEM.

Berlin, September 6.—Berlin is already very far advanced in solving the problem of easy locomotion in the town and the outlying suburbs and neither Paris nor London has done so much as the authorities and the public of the German capital to secure also the best motor service it is possible to procure. Many trials have been made and many vehicles had to be rejected until one was found which satisfied the severe critics and found favor with the Berlin experts.

The society for traffic undertakings (Gesellschaft fuer Verkehrsunternehmungen) in Berlin has already put several heavy electric cars on the road which found universal favor and the same firm under the guidance of Director Max Meyer has also succeeded in building the successful electrical omnibus, which very soon will appear on the Berlin asphalt and supersede the rest of the horse drawn vehicles which are now still in use. The electrical omnibus has been on its trial for months and many alterations have been made until it was brought to the present style of perfection.

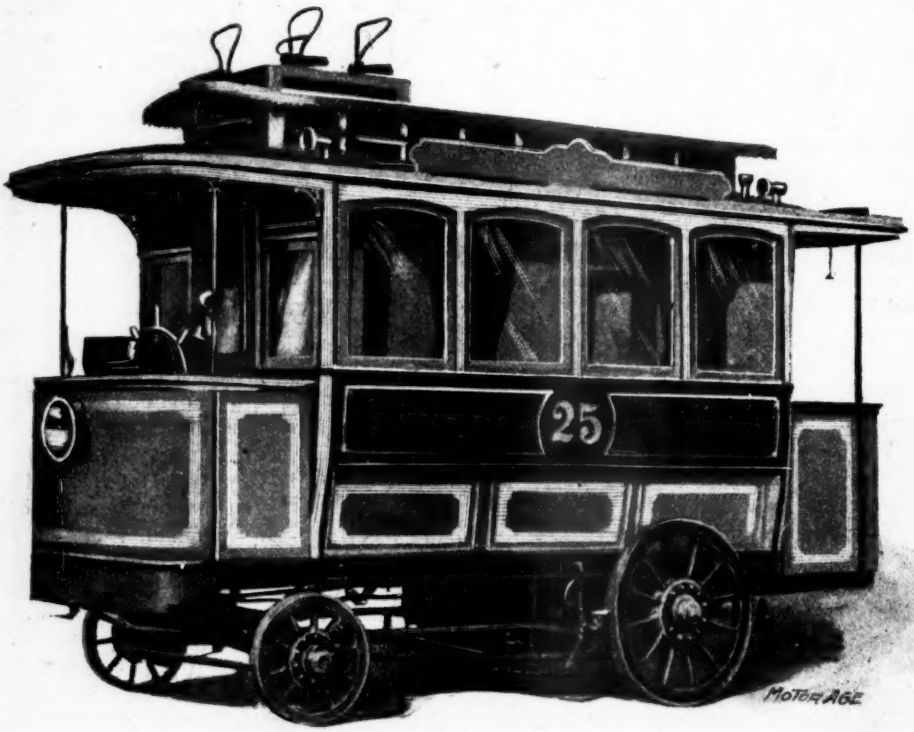
Frequent Recharging Found Desirable.

The omnibus represented is for 12 seats for inside passengers and 6 outside passengers to stand, but can be built for any number required. The omnibus has two motors. All moving parts are covered and protected against dust and dirt. The accumulators rest as usual underneath the passenger seats and the capacity of one charge of the accumulator lasts for 14 miles, but it is arranged that every motor is recharged after a five-mile journey when the omnibuses come to one of the resting places. Recharging the accumulators to full capacity takes between 12 and 15 minutes and is done automatically after a special system patented by the builders of the vehicles. The steering of the omnibus is done through a wheel like a steamer and the vehicle when full of passengers and at full speed can be stopped on a distance of 1½ yards. This is done through two brakes, a spindle brake and an electric brake. Steering can be done with one hand. The omnibus is splendidly illuminated with electric light in the evening. Its weight is 3½ tons.

Combined Trolley Car and Omnibus.

The International Motor Vehicle Exposition which was opened on September 3 and at which 150 German and French vehicles are displayed, but no English or American ones, first brought the above mentioned omnibus to the public's atten-

tion. Another interesting exhibit is that of Siemens & Halske, who display the combination electric omnibus and street car that recently was designed for use in certain parts of Berlin. It is fitted with this firm's "stirrup" trolley and can run on the rails as a street car or on any ordinary pavement as an omnibus. The accumulators gather electricity in the storage batteries while the vehicle is running as a street car or is at a halting place. The motorman can enter or leave the car tracks without wasting a minute, all that is required being to raise or drop a pair of small revoluble disks, held in front of the car in connection with a fender, which serve to guide the car by following the groove in the rails.



THE BERLIN ELECTRIC OMNIBUS.

ENERGETIC PREPARATIONS IN DETROIT

Detroit, Sept. 21.—This city promises to become a center of motor vehicle manufacture. The preparations bear the ear marks of systematic effort and strong financial backing—the first requisites for success.

The Olds Motor Works, of which the parent plant remains at Lansing, is erecting a large structure on Concord avenue, between Jefferson and Detroit avenues, where motors and running gears for vehicles will be manufactured. Arrangements are being negotiated for combining herewith one of the existing carriage manufacturing plants so as to enable the company to control the time of delivery upon orders for complete vehicles.

The new building comprises the following departments:

Offices and show room, three stories, 180x50, in the basement of which will be placed two 35 H. P. gasoline engines for power purposes.

The machine shop, which is nearly com-

pleted, two stories, 285x70. It will be equipped with traveling cranes.

The foundry, one and one-half stories, 140x70, with a 20x30 foot wing for core oven.

The pattern shop, two stories, 42x64, and the blacksmith shop, two stories, 65x45.

The boiler house, 32x34, with a smokestack over 80 feet high, is being built. This building will contain three boilers, for heating purposes only. There is a separate one-story building, 24x90 in size, for testing purposes, also a separate toilet-house, 25x30 feet.

The Union Transit Co.'s tracks run between the works and the river, thus giving the institution double shipping facilities. It is understood that the total investment of the company will exceed $500,000.

F. L. Smith is the secretary-treasurer of the company.

The Detroit Automobile Company was organized in July with a capitalization of $150,000 to exploit the gasolene motor vehicle construction devised by Henry Ford, electrical engineer of the Edison Light Company of Detroit. Its officers are Clarence A. Black, president; A. E. F. White, vice-president; S. S. De Lano, treasurer, and Frank R. Alderman, secretary. It has secured a long lease of the three story building fronting on Cass avenue at the Michigan Central tracks, formerly occupied by the Detroit Motor Company. The main building is 100x50 and a wing extends back, 50x200. The wing has been equipped with shafting and some machinery, and new machinery arrives almost every day.

Mr. Ford has so far made two experimental wagons and is at present making three new ones considerably remodeled in regard to the general appearance and the running gear.

The motor has two cylinders placed oppositely lengthwise of the vehicle.

The transmission gear permits two forward speeds and one reverse, and the intermediate speeds are obtained by motor regulation. The most important patent in connection with the construction pertains to the gas "mixer" or feeder, from which both cylinders are supplied. The admission of the gas mixture to the cylinders is regulated by means of a rotary disk provided with various holes registering in certain positions to either admit the entrance of the mixture or shut if off, and also governs the exhaust ports. The rotary disk is driven by a ratchet and cam drive from the fly wheel, and a governor on the fly wheel shaft provides for slipping of the ratchet when the engine speed becomes greater than required, thereby causing a reduction in the number of explosions. The motor can be operated with gasolene and kerosene mixed as well as with standard grade gasolene.

Among other workers in the automobile field in this city is Charles G. Annesley of 1115 Woodward avenue, who, it is understood, is backed by M. L. Marr of Saginaw. Mr. Annesley has built four electric vehicles and three with gasolene motors. His preference is for the latter. His last vehicle has a 4-cylinder motor of 4½ H. P. (brake), weighs 900 lbs. and is intended to carry four passengers on two seats. It has four gear speeds and the differential gear is within the hub of one of the rear wheels on a plan similar to that adopted by Riker in his electrical carriages.

SPORTING CART AND WAGONNETTE

The accompanying illustration shows one of the latest samples of English wagonette, in this case driven by the German style of Daimler motor.

In the original illustration there is shown an awning raised on six posts, around which are hung waterproof curtains. The awning and posts may be readily removed, however, giving the vehicle the appearance as here shown.

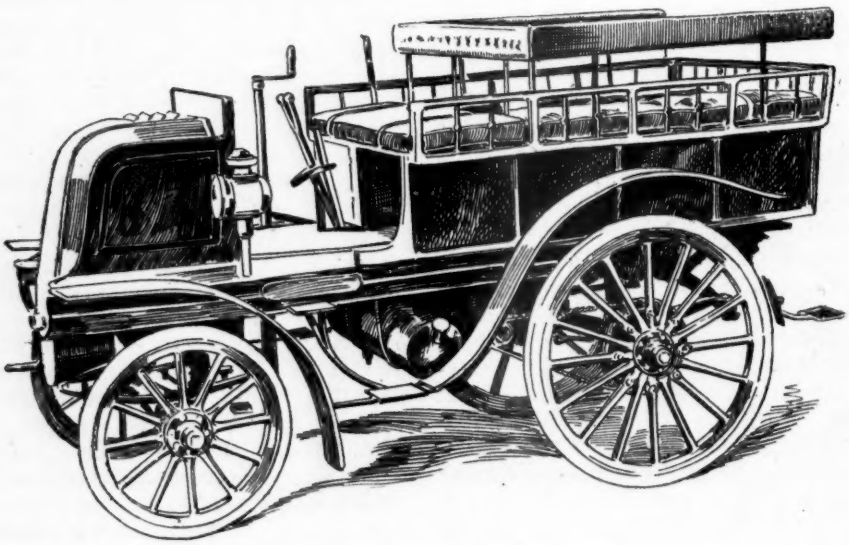
The Autocar writes about this production in substance as follows:

It was undoubtedly with feelings of pardonable pride that the Motor Carriage Supply Co., Ltd., invited us to call at Messrs. Mulliner's well-known carriage showrooms at Brook Street, Grosvenor Square, to inspect the sporting waggonette ordered by and about to be forwarded to the Duke of Westminster in Scotland. The order was only placed in the middle of July, so that delay in delivery does not obtain in connec-

tion with the Motor Carriage Supply Co. at all events.

We have dubbed the vehicle a sporting waggonette because the body, which was specially designed for the Duke's purpose, permits it to be employed either as a sporting car or a waggonette. It was as a waggonette that it was shown on Saturday last, and a very smart appearance it presented. The body is of varnished English ash, with walnut panels, and is made with 3-in overhang, the seats again overhanging in their turn. This has been done to get a wide and roomy vehicle. The door opens the whole width of the car, and when it is desired that the waggonette shall give way to the sporting or station cart the seats fold down in the center, and give ample space for game or luggage.

The backrests to the seats are also removed at will. The motor casing, springs, wheels, and all the carriage work, frame, etc., are finished blue and lined orange, the Duke's racing colors. The ample splashboards are of varnished English ash. The details of the four nominal horsepower Cannstatt-Daimler motor, with its fan-cooled water tank, made after the style of a marine condenser, are too well known to need repetition here. It is enough now to say that the vehicle, as we saw it in all its fresh glory of color and finish, undimmed even by the dust of a most successful run from Northampton to London the day before, with its ducal coronet and a crest on motor case, panels, and door, is a credit to all who have been connected with its production. It goes almost without saying that we anticipate a good effect upon the industry particularly, and automobilism generally, from the ownership of the Duke of Westminster of so smart, taking, and useful a vehicle. In order that we might have an opportunity of judging how the car ran, Mr. Lefebure proposed a trip round Hyde Park, and a very pleasant ride resulted. The motor ran sweetly, and the travel of the car over the lumpy macadam of the Park roads was so comfortable that no jolting whatever was experienced.



SPORTING CART AND WAGONNETTE.

MORE TALK OF TRUST

Louis Langan, manager of the St. Louis Gasolene Motor Company, has been approached by Charles Abrosch, of the Abrosch Carriage Company of Milwaukee, with a proposition to join a $5,000,000 syndicate to be organized to obtain a controlling influence on gasolene motor vehicle manufacture.

As soon as the gasolene motor shall have been produced which will run at engine speeds varied at will, down to a snail's gait, and which will run slowly and evenly without the assistance of a fly wheel and without unaccountable stops, the inventor will have a monopoly all by himself. The near possibility of the production of such a motor checks all efforts at organizing gasolene motor trusts at the present time.

AUTOMOBILES IN AUSTRALIA

Sydney, Aug. 15.—Every day, by cable and English and American mails, we are hearing of developments in connection with motor industry. Marvellous reports have come to hand from France, the latest of which is the covering of 1,423 miles by a 16 horse power motor in 44 hours 44 minutes. Of course the billiard table like roads of France permit of this great speed being accomplished, but one thing is certain and that is that the old world will never hear of such wonderful performances being accomplished by motors in Australia when they make their appearance here, as the roads are even worse than American roads.

The motor industry is being boomed by the principal Australian newspapers, and it is indeed a wonder that it is so slow in making its appearance here. There are one or two cars of local manufacture in Victoria, but there is not an imported motor car in the whole of Australasia.

Prominent men in coach building trade in Sydney are of opinion that the motor car will not be seen in Sydney for some considerable time. Mr. Vial, one of the largest coach builders and importers in New South Wales, in a recent interview expressed the opinion that several things militated against their speedy introduction in Sydney. In the first place there is a city by-law which prohibits the driving of any self-propelled vehicle through the streets at more than walking pace, and requiring that it should be preceded by a man with a red flag. Doubtless were the demand for motor cars to spring up this by-law would be repealed, as similar laws have been elsewhere. "Then," added Mr. Vial, "the cost at present is almost prohibitive to any but wealthy persons and there is not a large class of leisured rich people, such as exists in Europe, to whom expense is no object. Again, our roads are not too well adapted for automobiles, and though I have no doubt they will come, sooner or later, I do not think it will be for some considerable time. The most likely method of their introduction is through the medium of a strong company and probably once they appear other people will follow the example."

Mr. Angus, of Angus and Son, another big coach building firm of Sydney, expressed views similar to those of Mr. Vial. Mr. Angus has recently returned from a visit to America and Europe and while abroad he made it his business to find out all he could about the automobile industry, but he was not much impressed with the present stage of the industry and thinks that much remains to be done and learned before the new vehicles can be regarded as completely successful. He says that he made several appointments while abroad to inspect particular specimens, but there was always something wanting and he did not succeed in witnessing a really successful trial of one. As a toy for wealthy people, they were doubtless wonderful, but their employment in ordinary use was another matter. "They are bound to come in time," said Mr. Angus, "but that time is not yet." Asked his opinion of how long it would be before the automobile made its appearance in Sydney, he said it would probably be a matter of ten years. On the other hand, it might be in 10 minutes, but, personally, he was inclined to think the former more likely, or even a longer period.

Many busy brains are at work, said he, trying to solve the problem, and he thought the solution would come from America when it did come, but, just yet, he was convinced that as a matter of practical utility the automobile is not "in it" for Sydney.

EFFICIENCY OF ELECTRIC MOTORS

To travel a long distance on one charge of the battery and yet make a good showing in regard to the durability of the battery is what every maker of electric vehicles aims after.

This aim induces him to make his vehicle heavy or, on the other hand, to sacrifice some of the durability in favor of the longer radius of travel. But lately

it has been found that the desired object may be accomplished to some extent without either adding weight or sacrificing durability.

The new system rests upon the observation that one line of battery and motor construction gives the highest efficiency at the medium speeds—from 8 to 12 miles per hour—the consumption of power being proportionately large at slow speeds and at high speeds, while another line of construction which is otherwise not so well adapted for ordinary motor vehicles, gives much better results at the low and high speeds. It has been found possible to combine the two systems and thereby raise the motor efficiency considerably for the average form of travel in which all speeds are used. The experiments by which this has been ascertained have been made with street railway cars, but are probably already being applied to motor vehicles.

An explanation of the new principle has been promised The Motor Age for one of its next issues.

RECORD OF AN ELECTRIC RIDE

The American Electric Vehicle Company of Chicago publishes the following extract from a report made by G. W. Knox, chief electrical engineer of the Chicago City Railway Company, in regard to a test trip with an American Runabout.

* * * The day was fair, with a strong, shifting wind, which at times reached a velocity of 35 miles per hour. The roadway for two-fifths of the distance traveled was asphaltum, the remaining portion being principally macadam, with some brick, granite, and wood blocks, (of which latter much was very rough and uneven) and some twenty grades varying from 1½ to 3½ per cent were encountered.

The vehicle used was the American Runabout type, 36 in. rear and 34 in. front wheels, mounted with 2¾ in. pneumatic tires, with 4.3 in. wheel base. One single 1¾ in. H. P. single reduction multipolar motor was used, geared to the rear wheels with ordinary straight spur gears at 12.8 gear ration. The batteries consisted of 48 eighty ampere hour cells, weighing 523 pounds. The vehicle complete with batteries, motor and balance of equipment, weighed 1125 pounds. In the carriage besides myself was a man weighing 209 pounds, our combined weight being 375 pounds, thus making the total weight of the vehicle equipment and its load 1,500 pounds.

The maximum current consumption in starting from inertia was 36 amperes, the throw of the am-meter needle showing 10, 20 and 35 amperes. The maximum current against the strongest gusts of wind was 18 amperes. The average running current was about 12 amperes, but at times ran as low as 10 amperes. The current consumption in ascending the heaviest grades—3½ per cent—from 200 to 300 feet long, was 15 amperes.

At the start the odometer registered 16 miles, and at the finish showed 79.5, making a distance of 61.5 miles traveled.

The speed of the vehicle at the end of the trial was at a good rate, and had not decreased more than 25 per cent, and I believe from 5 to 8 miles more could easily have been gotten out of the batteries before they could be considered "run out."

The voltage of the 48 cells at the conclusion of the run was 97½ volts, thus showing per cell 2.03, which represents a drop from initial potential of each cell of about .09 volts, which certainly is a very low reduction from the initial, considering the amount of work accomplished; it being proper to run the batteries down to 1.8 volts per cell, indicates that there still remained a safety factor of .23 volts per cell to work upon even after such a long run.

BERLIN'S ELECTRIC MAIL WAGON

Postal Director Griesbach in Berlin has after cautious experimenting definitely abolished horses for parcel delivery on a route between several postoffices and railroad stations in the German capital and has substituted an electric wagon. It was first tried empty, then loaded but accompanied with the old horse-drawn conveyance and finally it was put into service without extra precautions. It makes three runs daily, covering in all 25 English miles. The electricity consumed costs about 40 cents per day. The other items of expense have not yet been ascertained.

It is for this kind of use—that is, route work covering every day the same comparatively short distance over streets of known and excellent quality—that electric vehicles have proved themselves most eminently suitable.

INDEX

RAILWAY INSPECTION MOTOR CARS

101

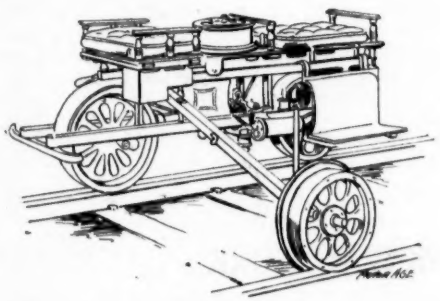
THE GASOLENE MOTOR SYSTEM APPLIED TO RAIL LOCOMOTION IN THE FORM IN WHICH RAIL TRAVELING REMINDS MOST OF MOTOR ROAD VEHICLES.—PROBLEMS MUCH SIMPLIFIED BY ABSENCE OF ROAD JOLTS AND STEEP GRADES.

The railway inspection motor car, of which brief mention was made in The Motor Age of September 19, is made by the Sheffield Car Company of Three Rivers, Mich., and is shown in the accompanying illustrations in the single three-wheel pattern and in the double type obtained by coupling two of the single type together with omission of the third wheel.

The manufacturers speak of its advantages in part as follows:

Ease of Handling

The specially desirable feature of the Three Wheeled Motor Car lies in the fact that it can be readily handled by one person and can be put on or taken off the track at any



Three Seated Inspection Car.

point in a few seconds, without even waiting to reach a road or farm crossing. The man handling the car picks up the rear end by means of hand grips, conveniently placed, and moves it as he would a wheelbarrow, it not being necessary to lift it bodily.

Usefulness.

Its use enables the Roadmaster or Engineer of Maintenance of Way to visit all parts of the line under his charge every day or two and with exceedingly small expense, and every railway manager knows the value of this in improvement of road bed and increased freedom from annoying and expensive accidents, to say nothing of greater durability and lesser repairs of the motive power and rolling stock that comes from smoother track. The officials in charge of track are more efficient in every way, and can give greater attention to the detail of their work, as they come in from their daily trips fresh and not worn out, as in many cases where the runs have to be made on a hand car. The Roadmaster, moreover, has been able to give his personal attention to a vast number of details that are impossible under the old method of riding on the rear of the train, and we believe the use of the Motor Car will save its cost on any railroad it is used.

The engine is a double one and has cylinders of proper size, fitted with trunk pistons, and is so arranged that an impulse or propelling movement is given the axle at every revolution.

The gasolene is carried in a sealed copper reservoir, which will contain enough to run 125 miles of average road, though of course, the conditions of grade or strong head winds may make it necessary to replenish sooner, a supply being carried in an additional reservoir for the purpose, equal to nearly 250 miles in all.

The spark is supplied by hermetically sealed chemical batteries. A hand switch makes the connection, closing the circuit at will.

Operation.

In starting, gasolene is turned on, the air valve is set and the switch lever closed. It is necessary to run the car a few steps to get it under motion.

The valves and other parts of the power device are carried directly upon the cylinders.

Design of Wheels.

The driving wheel is equipped with the Sheffield Concave Steel Tire, which constantly tends to hold the car upon the track, even at high speed, although it should always be remembered that there is comparatively but little weight to hold the car down and it is therefore not advisable to run the car at its utmost speed at any time.

All wheels have forged steel hubs, wood centers and steel tires.

The cars will carry three persons with ease up ordinary grades. They are designed for the use of Roadmasters, for track inspection, telegraph repair work, and whenever there is need for long trips and frequent stops between stations.

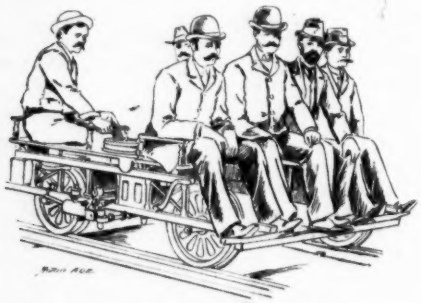
Carrying Capacity.

The Single Motor Car is arranged for three riders by means of a folding seat in front. Brakes are provided for both the front and rear wheels so that the car is constantly un-

der control of both the operator and the inspecting officer.

Double Car for Inspecting Parties.

In the double car two complete single three wheeled motor cars are used, and after discarding the third wheel, together with the arm and brace rod, the two main frames are joined by a seat that runs across the front of both, containing ample room for four persons. Back of this, but between the two main frames is a platform upon which a considerable amount of hand baggage or tools



Six Seated Inspection Car.

can be carried if desirable. At the rear of the car the two driving axles are united by a connecting shaft having universal couplings, by which means any propelling impulse communicated to either of the rear drives is received by both. There is also on each of the main frames a rear seat for an operator, making a capacity on the device for six persons. Each main frame having its full double engine, there is ample power for use of the car with its full load under all ordinary circumstances.

The style of the car also has the advantage that when it is not desired to use it in the completed form shown as a four wheeled rig, the two parts can be quickly separated and made up into two separate three wheeled cars, which are then suitable for the use of separate roadmasters until such time as they may be again wanted in the four wheeled type.

Railway Officials Approve.

A number of roadmasters, superintendents, engineers and trainmasters testify their satisfaction with these cars. One of the most conservative endorsements reads as follows:

After using one of your Motor Velocipede Cars ten months, I cannot recommend it too highly for track and bridge inspection, or any service in this line usually performed with train. I have frequently, while Roadmaster, inspected 80 to 100 miles of track, stopped at all section gangs, tool houses and switches. Have run car on trial test up to speed of 32 miles per hour, but will make 18 to 22 miles with safety. My car has three-fourths-inch cylinders, and will carry three men on one per cent grade, two men up two per cent grade and one man over three and one-half per cent grade, with maximum 10 degree curvature, and make 15 miles per hour. With proper care it is always in condition for service; is light, can be set on or off track quickly at any place by one man; places inspector directly over and close down to rail, making every defect visible. Must be used to be appreciated fully.

IN USE FOR MUNICIPAL WORK.

Chief Charles Logue of the Repairs Division of the Public Buildings Department of Boston uses a Stanley steam wagon for all the many business trips around town for which he formerly used a horse and Concord wagon. But the automobile doesn't have to rest, as a horse does, and when the chief isn't using the machine it is pressed into use for other business of the department. Mayor Quincy himself has ridden in it several times, and while he is well satisfied with it, he is not at all sure that some other type of carriage will not prove better suited to the needs of the city, says Boston Transcript.

The people of the repairs division are inclined to feel pretty well satisfied with a machine that will do a turn of forty or fifty miles in the working hours of a day, however, and this carriage, according to Paymaster T. F. Magrath, covers about that amount of distance on every payday. Two, and sometimes three horses were formerly used on such a trip. Last Saturday shows about what has to be done with the carriage. Mr. Magrath started with Driver Jones from City Hall at about nine o'clock, then, in reaching the different sets of men who had to be paid, went to Boston Common, Chemical 11 house on North Grove street, Baldwin street, Charlestown; North Ferry and Orient Heights, East Boston; back to the home office on Plympton street; the gymnasium on D street, South Boston; Board

of Elections storehouse, K street; then five miles to the pumping station, Dorchester; the Austin Farm, on Canterbury street, beyond Franklin Park; thence a five-mile run almost to the Dedham line, to reach the parental school.

That was the limit, and the carriage was turned homeward again in the effort to reach the Rainsford Island boat before she left her wharf at the North End. But through an oversight the gasolene tank had not been filled at the noon-time stop, and the gasolene gave out, so that Paymaster Magrath had to finish his trip by electric car. The carriage has made the run from the parental school to the boat on other days, however, without a hitch.

There has been practically no trouble so far except in the matter of tires. The set now on the machine are of the pneumatic pattern, but are too small, and the rough riding over city pavements has shown a tendency to press the tire back against the metal rims in such a way as to cut the rubber. Yet there has been only one puncture. The wheels are of the bicycle pattern. A new set of tires is now being made, and these will be of larger diameter and thicker rubber. The carriage weighs, ready for the road, about 550 pounds, and will carry two persons. There is no space for carrying parcels or anything of that sort except in the space between the front of the seat and the dashboard. The men who have used it find it easy of manipulation, and like it because it is ready for use in a moment.

Another carriage is expected soon from the St. Louis Gasolene Motor Company, St. Louis. It was ordered some time ago for Superintendent Cottle of the electrical construction department. It was planned first to have an electric carriage, but later it was decided to try the gasolene motor as likely to prove more effective in the work required.

TWO VIEWS OF CONSTRUCTION

French constructors of gasolene motor vehicles have as a rule acquiesced in the idea that the vehicle must trepidate and give out noise when running slowly or standing still. Hence their preference for carburettors and unvarying engine speeds and their multiple levers for operation.

Americans are starting the industry with the idea of curbing the power of the motor to agree with the speed desired. Hence their preference for "vaporizers" and single lever of control. They have chosen the more difficult starting point in order to accomplish the best ultimate results.

THE HILLS OF KANSAS CITY

One of the new automobile journals publishes the following:

The true reason for the absence of automobiles in this city may be that no manufacturer has the hardihood to suffer a test of his product in this mountainous town. Automobile journals say more power must be had before makers will sell their machines for use in Kansas City. In commenting in its automobile department on the Star's account of Homer Reed's failure to secure motor carriages for Forest Hill cemetery, because, as he thought, the companies were too busy making pleasure carriages to fill orders for motor 'busses, the Cycle Age of Chicago says: "The manufacturers fight shy of Kansas City. The hills of that town are somewhat too precipitous for advertising motor vehicles at present, except in the undesirable form of accidents and breakdowns. The machinery for producing suitable motor omnibuses that will stand a heavy load and a heavy gradient as well has not yet been installed in our motor vehicle factories."—Kansas City Star.

The above quotation from the Cycle Age, whose managers announce their intention of publishing a motor magazine, is really good. It is a fact which is demonstrated every day that autobains can and do go wherever wagons and bicycles go. It would be well for the Cycle Age to inform itself before sending forth its new Motor Age.

If our contemporary is better informed than The Motor Age on the requirements for omnibus service, it should at least mention one instance where an automobile omnibus made in this country has hauled a load of, say, 20 passengers up and down steep grades with stops and starts when required. The nearest approach to this class of work which has been successfully performed was witnessed at the recent trials for heavy freight wagons at Liverpool, England. The motive power was in nearly all of these freight wagons derived from steam engines. There is theoretically nothing to hinder the application of similar pow-

erful motors—steam or gasolene—to omnibus work, but as a matter of fact motor omnibuses are not as yet run anywhere over very steep gradients. Running continually over steep grades the steam motors would require excessively frequent renewal of water supply or a rapid, and therefore bulky, condenser. Electric traction is out of question whenever the payload must be very large and gasolene motors for such heavy and slow work have not yet been tried in practice in America. The case is quite different if the roads are uniformly level and smooth, but even for such lighter work there is hardly any precedent in this country—when omnibuses are in question—that would warrant a manufacturer in accepting orders.

WOULD BE NICE BEGINNING

The Kensington Bicycle Mfg. Company, of Buffalo, J. J. Gibson secretary-treasurer, announces its intention to abandon the bicycle business in favor of the manufacture of electric vehicles, as soon as practicable. Their present intention is to make the batteries at their own factory, and they expect to turn out about 30 electric vehicles before October 1, having orders on hand for this number at about $1,500 apiece.

WILL MAKE TRACTORS ONLY

The Tractor-Truck Automobile Company, of Philadelphia, makes gasolene motor tractors intended to be hitched to ordinary wagons instead of horses. It will also build electric tractors to be used with any ordinary vehicle by removing front wheels and axle and substituting the tractor. No details of the construction are given by the company except a drawing showing an electric tractor supported on two wheels of ordinary size of front wheels for carriages and in addition a small trailing wheel.

KEATING CO. TO REORGANIZE

At a meeting at Portland, Me., last week, of the stockholders of the Keating Wheel Company of Middletown, Conn., it was unanimously voted to increase the capital stock to $5,000,000 and to change the name to the Keating Wheel & Automobile Co. The present capitalization is $250,000.

WESTINGHOUSE COMPANY'S CHANGE

The buildings at East Pittsburgh, hitherto used by the Westinghouse Company for the manufacture of arc lamps, have been transformed for the manufacture and fitting up of motor vehicles, and it is said the company's capacity is now about fifteen of these vehicles a day.

CONTINUED IN NEXT ISSUE

Continuation of the article "From New York and New England" which has been omitted in this issue for lack of space will be found in The Motor Age of October 4.

The postal authorities in Berlin, having decided in favor of electric vehicles for certain short-route work, have ordered two gasolene motor wagons for trial on other kinds of work.

THE BALTIMORE MOTOR RACE

RECORDS LOWERED, BUT PERFORMANCE SHOWS THAT HIGHEST SPEEDS WERE DECIDED BY THE WORK OF PEDALING MORE THAN BY DIFFERENCES IN MANAGEMENT OF MOTORS.

Baltimore, Sept. 22.—New figures for motor tandem racing for 25 miles were established at the Coliseum to-night, when Miller and Judge cut their own American record of 39:58 made at Manhattan Beach on Labor Day down to 39:46 1-5. This performance was all the more remarkable from the fact that the race was run in a "wooden bowl" only a sixth of a mile in circumference. The closeness of the contest and the frenzied excitement it aroused in the 4,000 spectators may be judged from the fact that the leading "corn-poppers" were together all the way and Miller and Judge only beat Fournier and Steenson by a length. Waller and Stafford were even with the other two until fifteen miles, at which point Waller lost his pedals and with them two laps. This cost him all chance at the winning purse, though he and his mate made a game struggle to make up lost ground.

This time there was no advantage gained by the superiority of Miller's machine and pattern of De Dion motor. Fournier's outfit was somewhat similar to the Parisian importation. It had a muffler, carried a square gasolene reservoir on the top brace between the riders and was of shorter wheel base. It was a pure case of better conditioned men that pedaled rather than superior motor power that propelled.

Circuit of Races Planned.

With the fame of these thrilling motor tandem contests at New York, Waltham, Philadelphia and Baltimore has come great and growing public patronage and enthusiasm for this kind of racing, which bid fair to make motor matches a most serious rival to bicycle races among the followers of contests awheel as well as the general public. Already arrangements are being made for a circuit of motor races extending through the principal Southern cities and reaching Madison Square Garden in December before extending to Southern California for the midwinter and possibly Cuba early next spring.

RACE ON ASPHALTED STREET

The Item of Philadelphia is trying to organize a race for motor vehicles to take place on Broad street of that city, an asphalted thoroughfare. The enterprise is being applauded by Philadelphia business men as likely to bring trade to the city. Its value from any but a spectacular point of view, is of course insignificant. It will probably not come off, because the manufacturers of electric vehicles would know in advance almost exactly what the results would be. The vehicle provided with the strongest battery for its weight would be first. But for practical utility purposes a great many other points in construction must be considered by them. They would naturally be unwilling to pit a substantial and durable electric vehicle, designed to withstand the roughness of ordinary roads as well as possible, against another vehicle known to be inferior practically, although capable of higher speeds over a stretch of asphalt.

The Item's enterprise would not be good advertising for manufacturers and would be misleading to the public.

CHICAGO'S PROJECTED ENTERTAINMENT

The Arena Athletic Club of Chicago is preparing a series of automobile entertainments at Tattersall's to begin September 26. The promotors of the affair are James S. Evans and George R. Frankland, newspaper men, and it is asserted

that twenty automobile makers will be represented and twenty-five individual owners. It will be strictly popular and will cater to the eye more than to the understanding, as may be judged from the following programme:

At the exposition the evolution in roadway transportation will be strikingly shown. There will be the slave with his bundle, the burdened camel used in the desert, the jackass which is employed in the mountains, the ox wagon, and so on to the automobile.

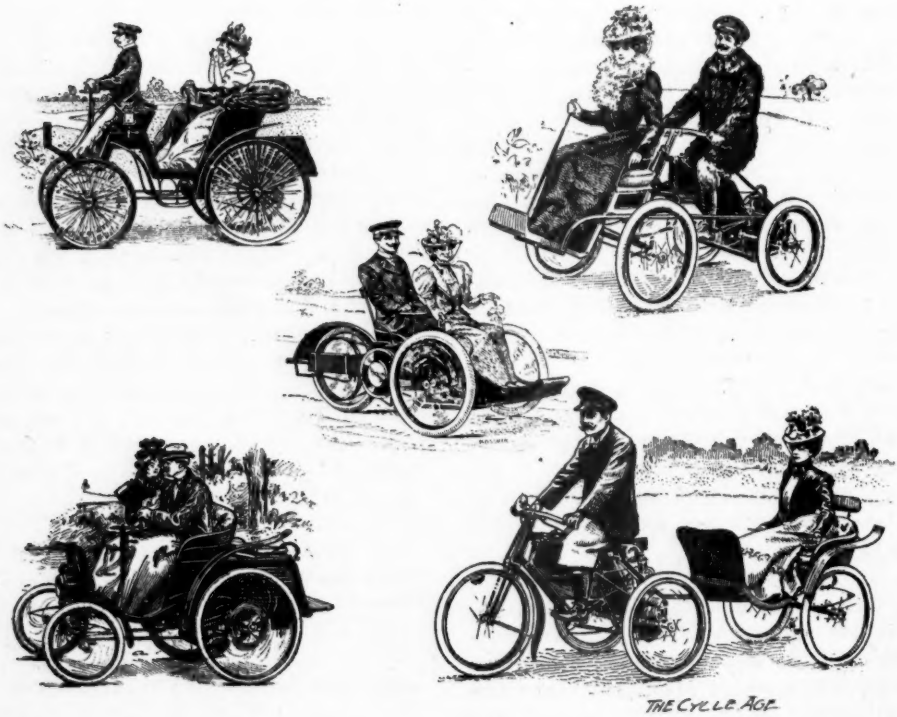
It is likely that the opening night of the festival will be given over to the society folk at Tattersall's, at which the hall will be brilliantly lighted and arranged for their reception.

At the end of the exposition there wil be a road race between Chicago and Milwaukee, in which it is thought there will be a dozen entries. The prizes offered are now being designed in New York. They constitute silver and gold cups, and in addition there will be cash purses.

CROSSED THE ALPS IN A BENZ

Baron von Aanchetti has crossed the Alps between Switzerland and Italy with a Benz Velo-Comfortable, a 3 H. P. motocycle. He drove by way of the Brenner pass which has an altitude of about 6,000 feet. The road is excellent and was traveled by about 25,000 horse-drawn vehicles yearly until the Brenner railway was opened in 1867.

TYPES OF FRENCH MOTOR VEHICLES



The engraving shows some of the prevailing styles of French motor vehicles and motocycles for pleasure driving. The cuts are some of those used for advertising purposes in French publications, but three of them represent types which are now rapidly disappearing in favor of vehicles with enclosed engines and gearing and patterned after carriages in their general style, though lower and not provided with leather tops or other speed-reducing appurtenances.

INDEX

EISENHUTH'S COMBINATION MOTORS

A SPECIAL TYPE AMONG THE MOTORS PROPOSED FOR AMERICAN MOTER VEHICLES.—INTERNAL EXPLOSION MOTOR IN WHICH SURPLUS POWER IS UTILIZED TO COMPRESS AIR THEREBY REDUCING VIBRATION AT SLOW SPEEDS AND RE-ENFORCING THE MOTOR WHEN REQUIRED.

The combined use of explosive gas and compressed air in vehicle motors does not represent absolute novelty. The idea has been conceived and tried by several of the pioneers in motor vehicle construction. But it has never been worked out to practical conclusions and employed in a vehicle that was considered good enough by its designer to be placed in the market, except by J. W. Eisenhuth of 40 Wall street, New York.

This gentleman declares it his purpose to manufacture motor vehicles driven by this combination system and to have a large factory for this purpose in running order for the beginning of next year. As he is apparently capable, financially and otherwise, to carry this purpose into effect, a description of his motor mechanism is undoubtedly of interest. He has a large number of patents and many modifications of the motor principle according to the style of vehicle to which he would apply it, but a description of one of the latest applications will suffice to show constructors generally to what extent the combination idea has been made feasible.

The example selected is from a British patent of August 12, 1899.

Oscillating Cylinder Operate Valves.

The motor is mounted above the rear axle of the vehicle and has a main cylinder 1, which is of the oscillating type and mounted in bearings 2 upon the upper ends of the arms 3 of the vehicle frame. Continual lubrication of all rapidly moving parts is provided for, and the cylinder is almost completely surrounded with cooling-water. No special design of carburettor is insisted upon. The gas admission valves are operated by the oscillations of the cylinder and the cycle of movements is described as follows:

The connecting pipe 27 is provided with a regulating valve or cock 28. A lever for operating the said valve extends up to within easy reaching distance of the seats of the vehicle. Above cylinder 1 a gas compressor is mounted as 29 consisting of a cylinder provided with a piston 30. The piston 30 is mounted on the inner end of a piston rod 31, the outer end of which rod is connected by an arm 32 with the piston rod 5. By this construction it will be noted that the piston 30 will have a movement corresponding to the movement of the piston so that upon every reciprocation of the piston 4, the piston will compress a new charge to drive the piston 4 to the opposite extremity of its movement again. The cylinder 1 is provided with compression chambers 33 near its ends. which extend part way around its circumference. These compression chambers 33 communicate with the cylinder 1 through valve openings 34. The compressor cylinder 29 communicates with the compression chambers 33 by means of valve openings 35. The openings 35 are adapted to be closed by means of the valves 36 which are normally held against the said openings 35 by means of spring pressure, and the construction of

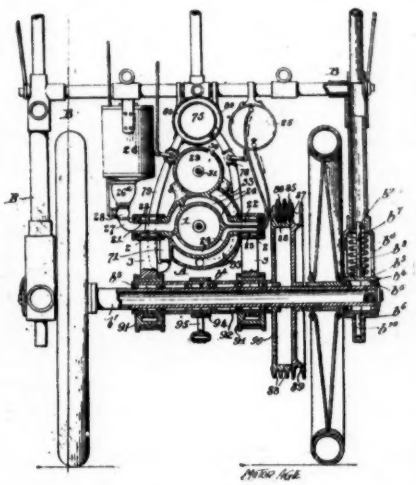


Fig. 1.—Vertical Transverse Section Through Motor and Rear Axle.

these valves is such that a charge of compressed explosive mixture can be forced from the compressor into the compression chambers 33 but cannot return into the said compressor. Apertures 34 are controlled by the valves 37, which are adapted to be operated in the following manner: Each stem of the valves 37 extends outwardly through the casing of the compression chambers 33 and through a tubular extension 38 formed thereon. Surrounding the tubular extension 38 is an enclosing cap 39 which is adapted to slide back and forth upon the tubular extension 38. Fixed upon the stems of each valve 37 is a collar 40 between which and the ends of a tubular extension 38 is mounted a compression spring 41 which normally tends to keep the valve 37 closed. Each cap

cylinder for admitting a charge of explosive mixture to be exploded and to drive the piston to the opposite end of its stroke. When the cylinder oscillates in the other direction the friction rollers 43 will be moved away from the raised portions 46 and the valve 37 will again be closed by the action of the spring 41. By connecting the blocks 44 at each end of the cylinder with the lever as 47 and by moving the lever 47, it will be seen that the blocks may be adjusted at different positions in their respective grooves so as to change the point of time at which the charge of explosive mixture is admitted to different ends of the cylinder. A suitable operating lever 48 extends ti within easy reaching distance of the seats for operating the said lever 47.

By this arrangement of the blocks 44, the

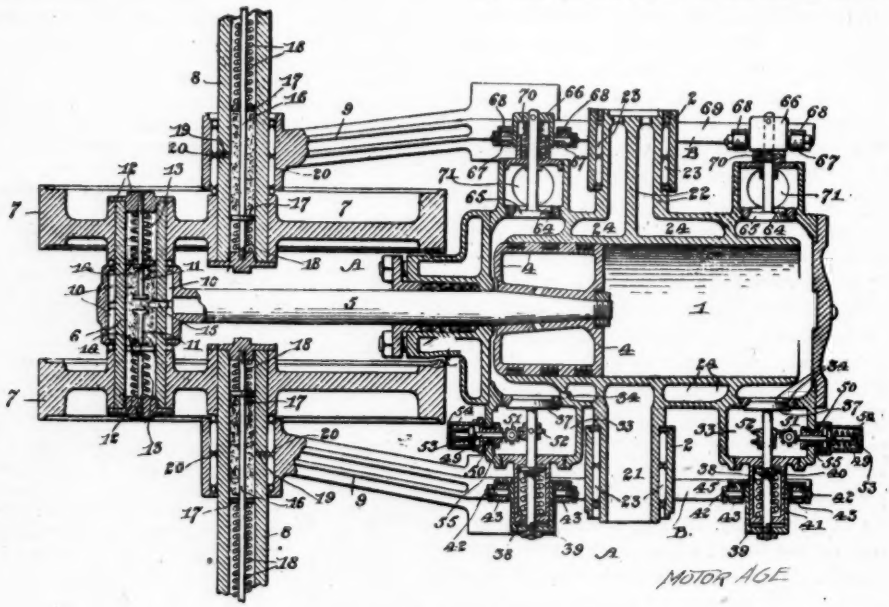


Fig. 2.—Central Horizontal Section Through Cylinder.

39—(the form of which may be spherical or rectangular, both of which are shown in the drawings)—is provided with side pins or studs 42 carrying friction rollers 43 which are adapted to engage adjustable blocks 44 mounted upon the extensions or arms 45, which are concentric with the center of the trunnion 21. The blocks 44 are adapted to be moved in the concentric grooves formed in the extensions or brackets 45 and are provided with raised portions as 46 which engage the friction rollers 43 and lift each valve 37 from its seat according to the oscillation of the cylinder. It will be seen from the above construction that upon the cylinder oscillating in one direction the friction rollers will strike the raised portions 46, and lift the valve 37 from its seat, thereby opening a communication between the compression chambers 33 and one end of the

operation of the lever 48 in one direction will raise one set of blocks, while it lowers the other set, thus causing the valves controlled thereby to be opened in such a manner as to actuate the engine in one direction. When the lever 48 is moved in the opposite direction, the blocks 44 will be changed to correspond and the valves controlled thereby will be operated at a different time so as to reverse the movement of the engine. It will be apparent that this valve controlling mechanism can be adjusted to admit the explosive mixture or compressed air to a nicety for running the engine at the desired speed and for reversing the same.

Valve Stems are Electrodes.

In order to secure explosions at the precise moments when the opening is

made to admit the charge into the cylinder, Eisenhuth makes the stems of valves 34 perform the function of an electrode connecting or disconnecting, according to the action of the valve, with the other electrode which is mounted in insulating bearings in the wall of each compression chamber 33.

Compressed-Air Mechanism.

The auxiliary use of compressed air is described as follows:

A very important feature of my improved motor is the means whereby I am enabled to use compressed air to run the motor at either end of the cylinder and at the same time that an explosive mixture is being used at the other end. In carrying out this part of my invention I provide suitable tanks for holding compressed air. Preferably at least two of these tanks are employed. A small compressing cylinder as 72 is mounted upon the frame at any suitable point and provided with a piston 73 connected with one of the fly wheel shafts 8 in any suitable manner to reciprocate it and cause the said compressor to force air into storage tanks as 74. These tanks 74 for holding the compressed air may be mounted below the motor, as shown in Fig. 3 of the drawings, or above it, as shown at 75 Fig. 1. These compressing air tanks are connected directly with the compression chambers 33 of the motor. In order that these connections may be adapted to accommodate themselves to the oscillations of the cylinder 1, flexible piping may be used if desired, or as illustrated in Fig. 3 of the drawings, a sliding packed joint as at 75a may be employed. These connections 76 are preferably provided with check valves as 77, which allow the compressed air to enter the said compression chamber 33, but prevent it returning therefrom. In forming the sliding packed joint 75 the connections 76 are formed on an arc struck from the axis of the trunnions of the cylinder as a center, one portion of the said points being attached to the compression chambers 33

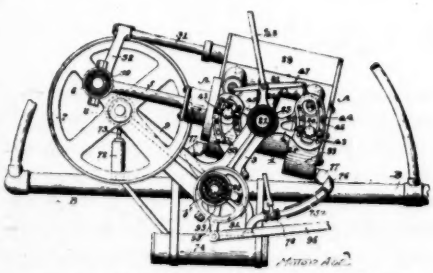


Fig. 3.—Vertical Section Showing Driving Gear; Cylinder in Elevation.

while the other portions which are adapted to slide in the first named portions, are secured to the compressed air tanks 74. It will be seen that by constructing these connections in this manner that the cylinder will be free to oscillate while at the same time a connection is maintained between the compressed air tanks and the compression chambers. In order to control the admission of compressed air into the compression chambers each connection 76 is provided with a stop cock 78, which is also provided with an operating lever adapted to extend within reach of the seat of the vehicle. After the compressed air tanks have once been charged the operation of the vehicle always maintains a supply of compressed air in the said tanks by means of the compressor 72.

In Fig. 1 a system for heating the air in the tanks by means of the exhaust from cylinder 1 is illustrated, the exhaust passage 71 being connected by pipe 79 with the jacket 80 surrounding air tank 75. Eisenhuth says in regard to the operation with both gas and air:

Usefulness of the Air.

It will be readily seen from the device described that I have adapted my motor to be run by a gaseous or explosive mixture or that I can use compressed air to assist in the running of the motor. When using the explosive mixture in both ends of the cylinder the supply of compressed air from the air tank is cut off by means of the cocks 78. In this instance the explosive mixture enters the hollow trunnion 21 and passes to each compression chamber 33 through the passage 81. The operation of the compressor piston draws a charge of explosive mixture into the compressor through valves 82 arranged upon the opposite side of the compressor cylinder 29 from the valves 36. These valves are similar to the valves 36 but are arranged to permit the explosive mixture to enter the compressor but to prevent its returning again. The compressor then compresses the explosive mixture and forces it through the valves 36 into the compression chambers 33, where at the proper moment, when the valves 37 are opened by the oscillation of the cylinder, it escapes into the cylinder, being ignited at the same moment. This drives the piston 4 worward to the opposite end of the cylinder 1 when the same operation takes place at the other end of the compressor and cylinder. When it is desired to use compressed air in one end of the cylinder, valve 82 near the end of the cylinder in which it is desired to use the compressed air—(see Fig. 4)—is held open by means of a lever 83, the said lever being adapted to engage a toothed quadrant 84—(see Fig. 4)—to hold it in any desired position. This permits the compressor at that end of the cylinder to exhaust the explosive mixture back into the inlet. The cock 78 from the air tank is then opened and the compressed air is allowed to enter the

compression chamber at the end of the cylinder which it is desired to run by air pressure. The pressure of the air in the compression chamber will hold the valve 36 closed so that the explosive mixture cannot enter the compression chamber and so that the compressed air also cannot escape

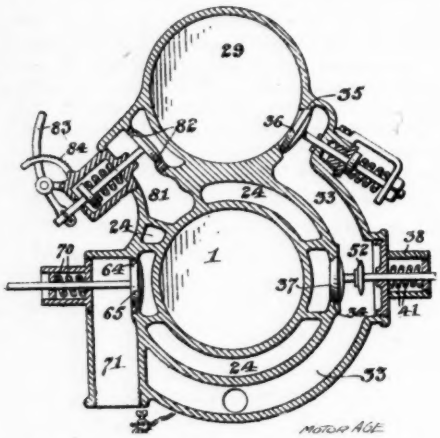


Fig. 4.—Vertical Section Showing Position of Valves.

in the same. The operation of the valve 37 at the end of the cylinder will permit the compressed air to rush into the cylinder at the proper time. It will thus be seen that I can use gas at either end of the cylinder and compressed air at the other end at the same time, which I find enables me to produce great power and yet in a way that does not affect the packing of the engine so much as heretofore.

The Driving Gear.

The driving gear is best shown in Fig. 3:

Upon the main shaft of the engine a pinion wheel 85 is mounted—(see Fig. 1)—which is adapted to be revolved by the operation of the motor. The pinion 85 is provided upon a portion of its periphery with frictional surfaces, as 86, and upon the remainder of its periphery with a cable groove 87. The frictional surfaces 86 are adapted to be brought into contact with corresponding surfaces 88 upon a gear wheel 90, mounted upon the main shaft of the vehicle. A cross cable is also adapted to connect the groove 87—(see Fig. 1)—with a similar groove 89 upon the said gear 90 on the main shaft of the vehicle. In the lower ends of the arms 3 and 9 of the engine frame on each side of the frame are formed bearings adapted to surround eccentrics 91. These eccentrics are mounted upon a sleeve 92 which surrounds the shaft b1 and roller bearings as 93 are interposed between the said sleeve and the said shaft whereby very little friction is produced between the parts. A collar 94 is secured to the sleeve 92 so as to be rigid thereon and is provided with an arm 95. The arm 95 is connected by means of a link 96—(see Fig. 3)— with a hand operated lever 97 which extends upwardly in proximity to the seat—(see Fig. 1). By operating the lever 97 the cams or eccentrics can be so turned as to force the gear wheel 90 away from the pinion 85 so that the frictional surfaces on the two gears will be separated. By carrying this movement far enough the cable connecting the grooves 87 and 89 can be made taut so that motion will be communicated from the pinion to the gear. This produces one speed. In order to change the speed the eccentrics are operated in the opposite direction, which will loosen the cable and bring the frictional surfaces 87 and 88 into contact and operate the vehicle through that means. It will be apparent that by bringing the gears nearer together or farther apart or at an intermediate point, the speed may be slackened or increased or the vehicle may be permitted to stop altogether. The gear 90 is preferably constructed in such a way as to be capable of adjustment.

PROJECTED CHICAGO OMNIBUSES

"The building of electrical omnibuses in Chicago is only a question of a short time," says C. S. Knight, vice-president of the Siemens-Halske branch company in Chicago. "All the work will be done in Chicago, and already we have increased our force from 212 to 800 men. We expect to demonstrate that this city is far behind the times in its transportation facilities. We are certain that so long as nothing is done by outsiders to introduce improvements, the street railway companies will not concern themselves about the matter. If we can put the storage battery system into practical use, the street railways will have no alternative but to adopt our plan. Our cars will carry from twenty to twenty-five people, and we can make money at a five-cent fare. If we cannot arrange for the use of trolley wires, we can establish charging depots in various quarters of the city."

Mr. Knight refers to the combination electric omnibus and street car which has been introduced by the Siemens-Halske company in Berlin and of which mention is made in another article in this issue. This omnibus runs on iron wheels and absolutely requires smooth asphalted or at least macadamized streets when it leaves the car tracks. Herein lies the greatest drawback to its usefulness for Chicago.

It is announced, however, that the combination of capital for the establishment of this autobus system in Chicago has been practically arranged, and that besides the Siemens & Halske company, which is to construct the vehicles, and the Illinois Electric Vehicle company, which is to conduct the system independently of their automobile business, electrical firms representing a capital of $5,000,000 are to take a hand in the venture. Each of the buses is to cost $3,500.

All the patents covering the company's system in Berlin have been registered in the United States and transferred for the use of the Chicago plant. Mr. Knight says the plant in Chicago will be enlarged for the manufacture of the buses, and that they will be put on the streets as soon as the immediate demand for automobiles slackens.

The design is at the outset to run the vehicles throughout all parts of the city on a system of time schedules at a five-cent rate of fare. The batteries of the cars are to be charged from a trolley wire along which they will run through the suburbs and in the outlying districts, collecting electricity in their storage batteries while on the move.

WHITE'S NON-VIBRATING MOTOR

Among the interesting attempts at devising a gas motor construction in which vibration shall be reduced to a minimum Ernest M. White of Philadelphia places one on record in The Horseless Age from which the following is reproduced. Mr. White writes:

Being in need some time ago of a light weigh four-cycle gasolene motor, that was simple in construction and that would run at high or low speed with but little vibration, I examined all that came to my notice, and tried many, none of which met satisfactorily my requirements.

Studying carefully the subject of balanced motors, I began a series of experiments, producing finally the motor shown in Fig. 1, and one which patents have been applied for, both in the United States and abroad. This motor met my demands and runs smoothly

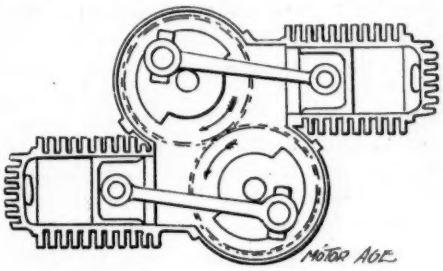


Fig. 1.—White's Motor.

and with scarcely any vibration whatever either at high or low speed. It will be noticed it is a two-cylinder, four-cycle motor, the cylinders being placed opposite, one above and parallel to the other. The pistons are connected to separate crankshafts, which are geared to each other so that the reciprocating and revolving parts move always in opposite directions, and at equal velocities, thus balancing each other. The explosions take place simultaneously in the two cylinders, their force is opposite and balanced. The exhaust valves of both cylinders and the electric igniters are operated from one reducing motion driven from the upper shaft, and the power is taken from either shaft.

Fig. 2 is a modification of the motor shown in Fig. 1. In this motor a shaft is placed between the crankshafts to which it is geared, so that it makes one-half the num-

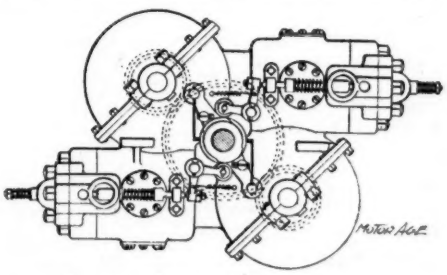


Fig. 2.—Modified White Motor.

ber of revolutions of the crankshafts. On this shaft, from which the power is taken. is placed the cam operating the exhaust valves of both cylinders, and the electric igniters, which are so constructed that the explosion may be timed to take place at any part of the stroke. The exhaust valves of both cylinders are operated by separate sets of mechanism, and the cylinders are cooled by water jackets.

STEEL-RIBBED BATTERY GRID

An iron grid for storage batteries that is especially adaptable for use on automobiles has recently been invented by J. J. O'Connell, a Chicago telephone engineer, says Western Electrician. The grid consists of a cast of wrought-steel plate, treated with a lead coating, to prevent the acid from attacking the iron. In the construction of the grid a one-eighth-inch steel plate is placed between two one-sixteenth-inch sheet-lead plates, and the three plates are then punched full of three-fourths-inch holes, spaced so as to leave enough stock for strength. Lead bushings are inserted in the holes and flanged over at the ends, so as not to leave the steel exposed. The whole grid is then tinned, in order to prevent electrolytic action between the iron and lead. Active material is put into the receptacles of the grid in the regular way. This combination gives a grid that is especially suitable for automobile work, as the plates are not as heavy as those made out of lead or compositions, and, moreover, are stronger and, it is claimed, will not buckle. The inventor says that his plate will last as long as any other plate on the market and is not expensive to manufacture. The thickness of the plate is, of course, arbitrary, but the same relation holds between the steel and lead, viz., the thickness of each lead plate being one-half that of the steel.

THE OTHER STANLEY FACTORY

The large factory at Kingsland point, near Tarrytown, N. Y., on the Hudson, where John Brisben Walker intends to manufacture Stanley steam vehicles, is being rapidly completed. The name of Mr. Walker's company is the Mobile Company of America. In a circular it is stated that "The Mobile Company of America is at this writing absolutely free of orders. All orders hitherto taken for the Stanley carriage have been turned over to the Locomobile Company of America."

CLEVELAND'S STREET CAR PROJECT

The Twentieth Century Automobile Company, of Cleveland, has been incorporated by Mathew Zeman, Thomas Woelfel, Stephen B. Melzer, Vaclav Kreja, J. M. Albl, John Volk and Edward Peterka, and is said to have accepted an order to deliver the first of four gasolene motor street cars within six weeks and the rest at intervals of one month.

Each of the vehicles is to be 20 feet long, 6 feet wide and to have seats for 22 passengers.

The project has been born of the desire to supply the striking street car employes with vehicles to operate in competition with the "Big Consolidated."

Joseph T. Clarkson, president; Charles F. Worthen, secretary, and Edward R. Brungs, secretary, are the temporary officers of an electric motor vehicle company recently formed at Amesbury, Mass. The promotors are carriage builders.

The Oneida, N. Y., Carriage Works are negotiating to sell out to the Oneida Automobile Company for $10,000, Charles E. Rennick of Oneida being the promotor of the deal.

A New Jersey man comes forward with the suggestion that in order to do away with all disputes as to the best name for the horseless carriage it shall be called the Dewey.